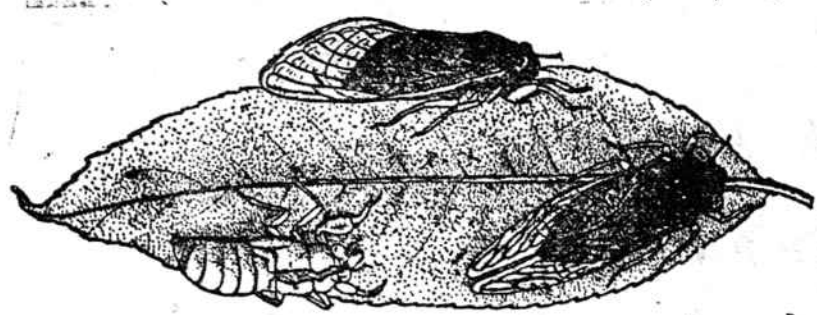


PERIODICAL CICADA OR SEVENTEEN-YEAR LOCUST IN STATE OF CONNECTICUT IN 1911

Pupae Produce No Appreciable Damage to Tree Except Splintering of Twigs Caused by Females in Laying Their Eggs—Peach Trees Suffer Most.



Periodical Cicada, Adults and Pupa Shell on Leaf. Natural Size.

(By W. E. BRITTON, Ph. D., Connecticut Agricultural Experiment Station.)

Brood No. II, of the periodical cicada or 17-year locust, *Tibicen septendecim* Linn., was scheduled to appear in the central portion of Connecticut in 1911, so we were on the watch for it. The station collection contains examples of this brood collected in Branford in 1894, by Dr. W. C. Sturges, then botanist of this station. But in 1894 no attempt was made to obtain records or to study the distribution of the insect in the state. In 1903, Brood XI, was expected, and though we made many observations and inquiries, we did not obtain a single record.

Consequently, 1911 seemed to afford an excellent opportunity to collect data, and in addition to the observations made by the office force, much information was gathered from other sources.

Though the pupae come out of the ground and crawl upon the trunks, branches and foliage of trees and shrubs, and the adults emerge, leaving the old shells hanging there, they produce no appreciable injury to the trees except the splintering of the twigs caused by the females in laying their eggs. Several correspondents wrote to this office that the cicadas were eating up their trees. But as the adults are sucking insects, they could at most only suck out a little of the sap, and could not devour any of the tissues. In laying eggs, however, by means of the sharp, tough and horny parts of the ovipositor, the female is able to puncture the hard wood and lay eggs in it. The ovipositor consists of three spear-shaped pieces or blades, the lateral ones having serrated edges for cutting. These pieces slide lengthwise upon each other, and are effective in mutilating the twigs.

The eggs are laid in longitudinal rows of punctures along the under side of the twigs of the previous season's growth, having a diameter of between one-fourth and one-half inch. Where there are many punctures in a twig it is often so weakened that it breaks in the wind, and though sometimes falling to the ground, it usually hangs, and the leaves dry and turn brown. There is damage to the trees, no doubt, from the effects of great numbers of the larvae sucking at the roots, but this injury is difficult to observe or estimate, and probably is usually attributed to other causes.

The greatest damage noticed by the writer was where peach trees had been used for egg-laying. The weight of the fruit caused the twigs to break and hang down, and the fruit as well as the leaves withered. In portions of the orchards mentioned nearly all the fruit was destroyed. Some twigs had five or six peaches each, and broke very readily from their own weight. Nearly all hung, however,

until the wood became dry and brittle before separating entirely from the tree. In addition to the loss of the fruit for the season, about a season's wood growth was destroyed, leaving little or no chance for the formation of fruit buds for the following year. On apple and other fruit trees the results were similar, though apparently much less serious than with peach trees.

On rapidly growing trees the scars soon heal, but on trees making a slow growth they do not heal for several years. Ordinarily, however, there is little or no permanent injury to the tree, and soon after the insects disappear the orchardist thinks little about them. The accounts of serious injury which one reads in newspapers are generally based upon the imagination or upon other causes, and are not the verdict of men who have given careful study to the subject.

Some six or seven weeks after the eggs are laid in the twigs, the young cicadas hatch from them, drop to the ground, and work their way into it, going 12 to 18 inches beneath the surface. Here they live a subterranean life for 17 years, where it is difficult to follow their movements and development. Yet this has been done in one case by the bureau of entomology, and it was found that the larvae molted four times, the fourth molt usually occurring about the tenth year. They burrow chiefly with their feeble legs, sucking the juices from the small tree roots from one-eighth to three-sixteenths of an inch in diameter, and upon such food they subsist for the full period of 17 years, when the pupae crawl out of the ground, leaving round exit holes about three-eighths of an inch in diameter.

No parasites were reared from cicada eggs in Connecticut in 1911, though four species of dipterous (two-winged flies) larvae are known to feed upon them in the United States. Four species of hymenopterous (four-winged flies) insects are known to parasitize the eggs, though only one of these, *Lathromeris cicadae* How., is at all abundant. This has been found sufficiently abundant in some parts of the country to considerably check the periodical cicada. Several species of mites are also known to feed upon cicada eggs.

This insect has predaceous enemies, one of the most important of which is the large digger wasp or cicada killer, *Sphecius speciosus* Dr., which stings the adult cicada and carries it away to its underground nest to serve as food for the young wasps.

The stinging paralyzes but does not kill the cicada, and the wasp lays an egg on the body of the cicada, upon which the daceous ground beetles devour some of the newly hatched young, as well as the emerging pupae. It is probably true that birds devour large numbers of cicadas.

should be made of wire netting in order to prevent mink and other animals from carrying off the chickens at night.

Nests are made movable and are placed on low benches in the sheds. A house of this size will give room enough for 100 hens. The houses are kept open all the time except in cases of very severe storms.

Two feed coops for biddies and the young chicks are kept under the front shed, where they are always dry and which allow the young chicks to run out on the ground in the garden.

I divide my poultry yard into two plots, one of which contains some fig and peach trees. I sow oats in the fall and field peas in June. The plot next to the poultry yard is sown in oats in October and they furnish the great deal of green food during the winter, and may be cut if not eaten off by June.

I give my chickens free range after they are three weeks old, but take great care to keep them out of the rain and early dew.

If you are unable to have poultry house and scratching shed, separate



White Plymouth Rock Hen.

nesting house, roosting house, bone cutters, self-feeders and all that sort of thing, just try my plan and you will have good success.

I make nests of clean leaves, straw, cotton seed or light trash with plenty of tobacco leaves. I give a broody hen one old nest the first day or two until I am satisfied she really intends to set, and then place 12 or 13 eggs under her. I always select the quietest hens for brooders and shut up the others in a well ventilated slat-coop and feed lightly on green cabbage leaves or other green stuff with plenty of water.

Baked corn bread is excellent for broody hens.

I move the slat coops every day, always placing them in the shade. I believe success in raising poultry is due as much to absolute cleanliness as anything else. It requires a great deal of work to keep your coops and poultry houses and drinking and feed vessels perfectly clean, but it pays better than any other kind of work a woman can do in the farm.

For grit in winter I save every piece of broken dishes and with a hammer and old piece of railroad iron I pound it up fine and keep a supply before the chicks all the time. I use this piece of iron as a dinner bell and my chicks all come running the moment they hear the strokes of the hammer upon it.

Sometimes I trade a fat hen to a restaurant or boarding house for a basketful of broken dishes.

Let me urge farm women folk to keep but one breed of chickens—the kind you like best, and the best for your purpose—that is for eggs or meat.

If you keep turkeys, ducks or geese do not let them into the chicken yard, but keep them in a separate place. Everything about the duck and turkey yard must be kept as clean as possible all the time. If the drinking vessels and feed troughs of the ducks and turkeys are allowed to become sour and dirty, trouble will surely follow.

GENERAL FARM NOTES

Cut out old wood in current bushes. Everyone should have a strawberry bed.

The bulk of the dairy cows fail to earn their board.

The pruning shears can be used every month in the year.

The beef cow ought to produce enough milk to rear her own calf.

When we all adopt the pure food law on our farms there will be less hog cholera.

To increase the supply of cattle it will be necessary to stop the slaughter of heifer calves.

Get rid of the windfalls as fast as possible. It means the destruction of many insect pests.

The Shorthorn-Angus cross, producing the so-called "blue grade," is very popular in Scotland.

The raising of winter lambs is a specialty that yields good returns and which makes pleasant work.

In packing grapes discard all green, overripe or shriveled specimens. Use ten pound baskets. Strive for neatness.

Horticultural work goes on forever and is hard labor. If you don't like the work you will not make a success of it.

Unless you have more than you can profitably dispose of nearby you will find it best to sell in the home market.

The cow that always looks wild out of the southeast corner of her eye surely has a master that needs educating.

With a pair of scissors or sheep shears pinch off the blackberry canes when they reach a height of three or four feet.

If you want a little fun leave the lot gate open. But the stock will get more fun out of getting out than you will get out of getting them in again.

It is poor policy to allow a young boar to cover more than one sow a day. Thus it is not advisable to allow the young animal to run with the sows.

The breeder of pure bred stock of any kind cannot ignore the market for common stuff, the sort of stock demanded by the buyers and the types that are most in favor.

You will get relief from Pain when Dr. Miller's Anti-Pain Pills are taken.

SILAGE

At a farmers' institute not long ago the question was asked: How many housewives have silos? You can very easily guess the nature of the replies to this question, for none of those present had much of an idea what a silo really is. After a short explanation it was agreed that nearly every one present in reality had a silo of some kind. Some of these were used for saving fruits, corn, and others for preserving cabbage, for future use. We don't really speak of these as silos, but the effect on the saving of these beds when placed in jars is the same as it is with corn when stored in the silo; in other words, silage is green corn preserved by storing in an airtight structure.

There probably are very few farmer boys that do not remember some rainy day or evening when all hands got busy preparing the cabbage to fill the kraut jar. Probably no thought was given the subject because it was a yearly task, and no one realized that in effect the saving of the cabbage by making it into kraut is the same as making corn silage. It undoubtedly served a good purpose in keeping the family in a healthy condition during the winter months when other green food was not available. The same is true of silage, which affords a succulent and nourishing feed for the livestock.

There may be a question as to whether all stock will eat the sour corn silage, but give them a chance and this thought will be quickly dispelled, for all stock eat silage very greedily, and the returns in the form of milk and meat will amply pay for all the trouble and expense.

Yours very truly,
I H C SERVICE BUREAU.

VEGETABLE OILS

L. O. Miller, Bernardston, Mass., writes as follows: "Could you kindly give me some information about vegetable oils that are used as substitutes for lard? In my opinion, could soy beans and sunflowers be most profitably grown?"

There are various oils to adulterate lard, but we are not aware of any oil that will take its place, or even add anything to its value. It seems that lard oil is the only one that has ever been found that possesses the proper drying qualities to secure the results desired. Whatever is added to it seems merely to be a detriment.

Soy beans and sunflowers may be profitably grown under some conditions. There are a great many regions where they will grow satisfactorily, and we believe that the middle west or west would perhaps give the best results, all things considered. In Colorado the Russian sunflower makes a wonderful growth. It is grown quite extensively for feeding chickens.

The soy bean is a crop that will stand a great deal of dry weather, hence is profitably grown on rather dry soils, although it responds to moisture as well perhaps as any other crop. It is grown extensively throughout the south; also some of the hardy varieties are found in the central section.

If you are thinking of coming west with a view to taking up such work as growing these crops, you can get information by addressing any of the state colleges in the west.

You may be able to obtain further information as to vegetable oils by addressing the Indian Refining Co., 17 Battery Place, New York, N. Y., or the Union Petroleum Co., 35 South Second street, Philadelphia, Pa.

Yours very truly,
I H C SERVICE BUREAU.

LAND DRAINAGE A NECESSITY

Well Drained Soil Will Give Best Returns—Care Should be Exercised in Laying Tile Drains.

Reply to J. C. Tally, Stevenson, Ala.

Drainage comes first, if the land needs it, and tile drainage is the modern and sensible way of draining. If the soil is low in humus, stable manure or vegetable matter must be added; if it is lacking in one or more of the elements of plant food, these must be supplied in commercial fertilizer, stable manure and legumes; if it is sour, an application of lime is necessary; if the soil is compact and there is a hard pan, deep plowing must be done. But if it needs drainage, stable manure, commercial fertilizer, vegetable matter, lime, and deep plowing will be of little avail.

There are many thousands of acres of land that are dry enough to induce farmers to try to farm them and are wet enough to soak all the profit out of cultivating them. Drainage on such soils is very urgent.

Drainage may be very simple or a very complex problem. It may require exact engineering so that every available inch of fall may be utilized or the location of the tile may be so apparent that the average practical farmer can easily locate it with the eye. Between these two extremes there are cases requiring varying degrees of skill.

If it is a complicated proposition the services of a reputable engineer should be secured. If there are merely wet spots in your field, or if your field is wet with plenty of fall, you should be able to locate and lay your tile with so difficulty by following the methods outlined in the Uniontown, Alabama, Canabake Experiment Station bulletin, Numbers 2, 5, 6, and 10. Be sure that no mistake is made in tilting your land. Tilling land is expensive and should be done right.

Yours very truly,
I H C SERVICE BUREAU.

Handsome Trophy for Best Corn

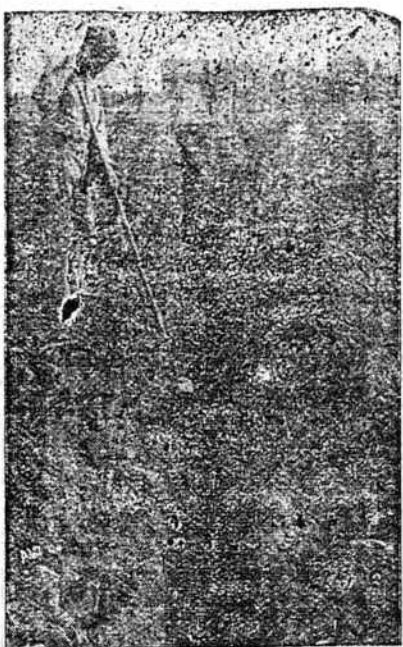
The American Land and Irrigation Exposition company, whose general offices are in the Singer building, New York city, is offering a handsome trophy, valued at \$500, to the farmer growing the best 30 ears of Indian corn of any variety with the largest yield per acre. The corn must be grown in the United States. Rules and shipping instructions and particulars for making entry for the privilege of competing in this contest can be secured by writing Mr. Gilbert McClurg, General Manager of the Exposition, Singer building, New York.

GUMBO SOILS

O. J. Berger, of Eudora, Kansas, writes: "I am on gumbo land, and it is not very well drained. I am told this land would improve if properly drained, and some say it can't be tiled, for a paste forms around the tile and the water can't get through it. How would concrete tile do? Can you give me any information on this subject?"

What we usually refer to as gumbo soil is a very heavy type of soil. In some localities it is very dark in color, while in other places it is slightly grayish in color. In the state of Iowa the gumbos soils are very dark and usually very heavy, while in parts of Kansas, also other parts of Iowa, the gumbos is of a light color, often of a reddish cast.

One of the first steps to take in attempting to handle gumbo land is to see that it is well drained. The very close grained, finely textured gumbos soils of Iowa have been drained suc-



Proper Treatment for Gumbo Soil

cessfully both by using open ditch and by using tile drain. In fact, some of the gumbos soils that have been tile drained often sell as high as \$200 per acre. The experience in handling the heavy, sticky soils indicates that it is not necessary to place the tile, as one would naturally think, close together and as shallow as first consideration might indicate. The experience of farmers in the heavy, waxy soils of Iowa shows that the tile lines are often placed ten to twelve rods apart, which is ample distance even in some other types of soil. The best way to settle this matter, inasmuch as these soils vary considerably, is to put in as many lines of tile as you can conveniently watch the effect, or use only one tile line and note the distance it drains on either side. This would take but a short time for the effect can usually be noticed on close observation.

It is highly important that you have a good outlet in attempting to use tile. After the land is well drained, the next important step is that of tillage. It has been found that for all kinds of conditions fall plowing is the best for gumbos soils. The action of freezing and thawing during the winter months renders the seed bed much more friable and reduces the clods in a way that cannot be accomplished by mechanical means. Care should be exercised not to plow or to cultivate this type of soil when it is unusually wet for it puddles very quickly, forming clods which can be reduced only by freezing and thawing.

One of the objectionable features of gumbo soil is the tendency to shrink when drying out, thus injuring the crop materially. The time that this occurs is usually during the summer months. This objection may be overcome by surface tillage, using the spring-tooth, peg-tooth or disk harrows, together with cultivators, or any other means of maintaining a surface mulch to a depth of three or four inches.

Gumbo soils when well drained and in a good state of cultivation, which may be maintained as stated above, give splendid yields; in fact, better than some other kinds of soils in the corn belt. A frequent application of stable manure is also beneficial to these soils, inasmuch as it supplies vegetable matter, thus rendering the soil lighter and putting it in a better physical condition.

Some claim that the cement tile are more porous and thus permit a freer movement of the water than the clay

tile, but in reality there is very little difference. As far as the pores of the tile becoming filled up about as quickly as the water that enters the tile goes through the joints and does not soak directly through the tile. You will find that well vitrified tile or carefully made cement tile will serve your purpose satisfactorily. In cases where the trouble from alkali is exceptionally severe, it may be best to use the clay tile in preference to the cement.

Yours very truly,
I H C SERVICE BUREAU.

LABOR SAVING

Farm Implements are Needed in the South

[By G. H. Alford, I H C Service Bureau]

The demand of the times is for improvement along every line; for building better roads, better homes, churches and school houses. We desire better equipment on our farms and in our homes. The teachers and ministers must have expensive educations, and hence demand better salaries. Telephones, rural deliveries of mail, libraries, etc., are becoming necessities. It is the desire of every parent to educate the children at colleges or good schools.

Apparently the key to agricultural improvement in the south is more power and labor-saving farm implements on the farm. The average farm worker toils with a small mule or horse and his total annual income is about \$148.00. In Iowa the average farm worker uses nearly four large horses and produces \$811.11 annually exclusive of stock. Investigators show a much smaller use of power on the southern farms than in other sections of the country, and, consequently, less use of labor-saving farm implements and a correspondingly lower earning capacity of the farmers.

The power must come first and then the labor-saving implements. Every farmer in the south can easily raise the necessary horses. He can better afford to buy extra horses than to attempt to farm with one or two small mules. By the use of strong teams and labor-saving implements, the wages of one, and sometimes two men, can be saved, and this will soon pay for an extra animal. However, every farmer should raise his own horses. A good team of mares will do more work than several small mules, such as are largely used, and the colts raised will be a handsome profit, or furnish the additional power needed to handle larger farm machines.

Money-making farmers have fully proved that summer and winter pastures and well cured hays should be the main reliance for feed. The feeding of horses and mules on pulled corn fodder and corn is so expensive and out of date that the practice should be abandoned. I saw seventeen fine mules that were raised on good pasture and pea vine hay. The mule colts obtained their living entirely in pastures from March 1 until December 1. The pastures were not brush patches or fields of weeds and briars, but tracts of fertile soil, well set in Bermuda grass, lespedeza, white and burr clover. Plenty of pea vine hay was kept in large racks for them, from December 1 until March 1.

High-priced labor makes it imperative that more and better farm implements be used. On every farm there should be at least a reversible disk plow or a large turning plow or disk harrow, two sections of steel harrow, combination planter, single row cultivator, grain drill mower and rake, or a binder and a hay press. The above are essential, and if the means of the farmer will allow, many other convenient labor-saving implements, such as a two-row planter, thrasher, gasoline engine, feed grinder, feed cutter, manure spreader, cream separator and an auto wagon can be added.

Yours very truly,
I H C SERVICE BUREAU.

GRASSES FOR WET LANDS

D. McWhinnie, of Farmville, S. C., writes as follows: "I have a flat of about 100 acres or so. About half of that is covered with water in the spring, which dries out about the middle of May so that one can work the land. I had thought that I could grow hay on it if I could get the grass started. Can you tell me the best

Dr. Hartman Says:

Write to Peruna Testimonials If You Want to Know the Truth.

The following letter was received by Dr. Hartman through his regular correspondence:

"I notice the testimonial of Mrs. Alice Bogle, which you give in your last article. If I should write her do you suppose she would give me further particulars? I have heard it said many times that such testimonials are fakes, that they are either absolutely fictitious or else the people have been hired to write them. I have been inclined to write you a great many times but these stories about patent medicine advertisements have discouraged me from doing so. I am afflicted with catarrh and should like very much to find a remedy such as your article describes."

To the above letter Dr. Hartman made the following reply:

My dear Madam:—I do not wonder that you are confused and have lost all faith in advertised remedies. There has been so much said against them, so much controversy concerning them, I am not surprised that some people have lost confidence in them.

I wish you would write Mrs. Bogle, as one woman to another. I wish you would ask her whether she has been hired to write such a testimonial, whether her testimonial represents the truth.

I hope you will remember that she is a housewife, like yourself, that she has something to do besides write letters, that she is a woman of moderate means and cannot afford to write these letters and pay her own postage. I hope you will enclose stamp so she can answer you without loss to herself. Mrs. Bogle is a very estimable lady and no doubt you will both profit by being acquainted with each other.

Should you conclude to try Peruna for your catarrh I would be very glad to hear of the result. I can assure you that no use will be made of your letter, except by your written consent. Mrs. Bogle very kindly consented to have me use her letter, which is my reason for doing so, and you will be treated exactly as she has been.

People recover from chronic catarrh who take Peruna. There is no doubt about that. Some surprising recoveries are reported almost daily. I have thousands of them in my files. PERUNA IS FOR SALE AT ALL DRUG STORES. SPECIALS: Many persons are making inquiries for the old-time Peruna. To such would say, this formula is now put out under the name of K-A-T-A-R-R, manufactured by K-A-T-A-R-R Company, Columbus, Ohio. Write that name and you will be pleased to send you a free booklet.



—If You Need A—

Monument, Headstone or Marker, get my prices. I will save you money. You need an Iron Fence, I furnish the best for the money. Yours to serve,
H. F. SLAYER,
Monterey, Va.

Agent, for The Clifton Forge Marble Works.

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Mr. Koffman who is well known to the people of this section, will remain with the new firm and will make his usual visits to Highland and adjoining counties.

If you are interested write for catalogue and prices.

M. A. LAYMAN.

Veterinary Notice

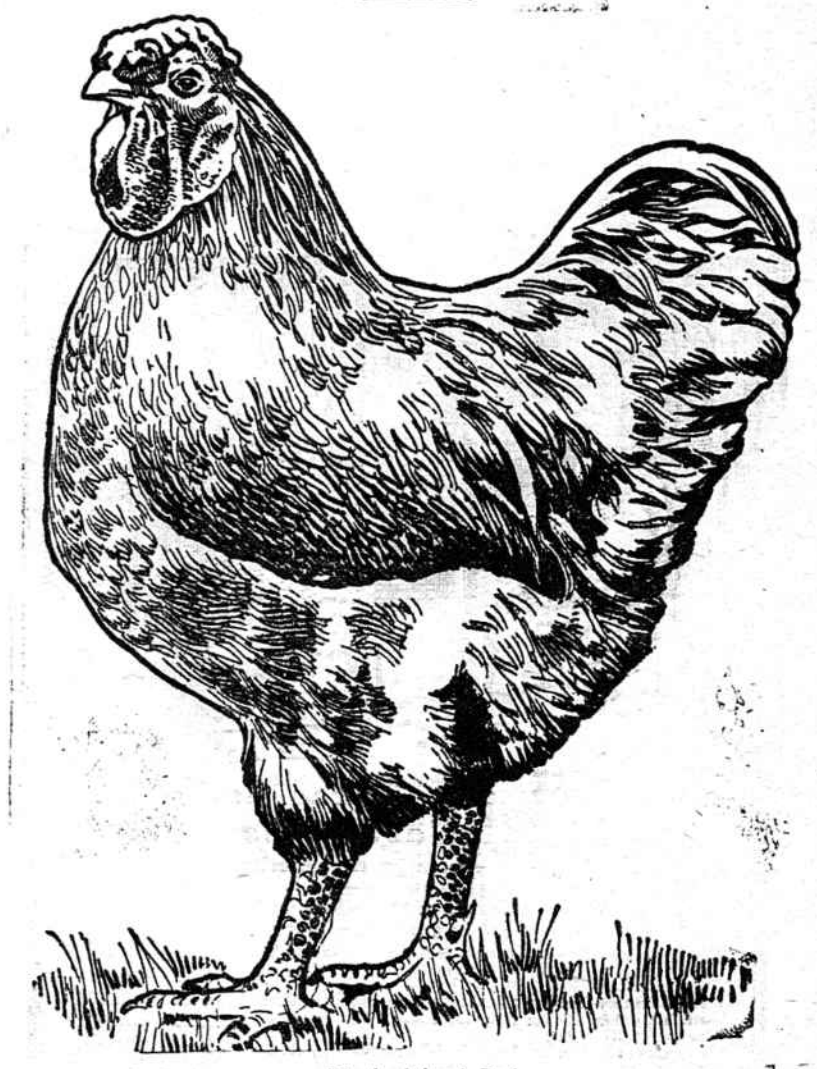
I am permanently located in Monterey for the purpose of practicing Veterinary medicine, Surgery and Dentistry.

Soliciting your patronage, I am respectfully yours,

Dr. A. W. Miller, D. V. M.

ATTENTION TO DETAILS WILL INSURE PROFITABLE RETURNS FROM POULTRY

Experience of Louisiana Raiser Proves That Clean Quarters, Fresh Water, Good Food and Systematic Care Are Few of Essentials Required With Fowls.



Rhode Island Red.

(By Pearl C. Stegall, Louisiana.)
I built all my poultry houses 10 by 15 feet and let the cover extend 8 feet in front and 8 feet on each side. I find this a good style of house for this climate, as it gives good sheds for nests or coops for the youngsters.

I make the roofs of strips three inches wide, not over three feet high, and fasten them slightly at each end, and by cleats so they can be removed for cleaning.

The floors of my houses and the sheds as well are made of dirt packed smooth and then covered with wood ashes. After this has been sprinkled with water a few times it becomes quite hard and is easy to keep clean.

The floors of the houses and sheds are somewhat higher than the ground outside. There is a door on each side and one in front and two windows placed rather high in the back above the roosts. The doors all open into the sheds under shelter. The doors